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14. ABSTRACT The Acoustic Thermometry of Ocean Climate (ATOC) project was a feasibility study to determine 1) the precision with which acoustic methods could be used to measure large-scale changes in ocean temperature and heat content and, 2) the effects, if any, that the acoustic transmissions would have on marine mammals and other marine life. Two sound sources were installed for this project, one on Pioneer Seamount off central California and one north of Kauai. Each of the sound sources transmitted for 24 months in accordance with marine mammal study protocols. The results from the study indicated that 1) acoustic thermometry is a powerful tool for making routine measurements of large-scale ocean temperature variability and heat content, as originally hypothesized, and 2) acoustic travel times can be measured with a precision of 20-30 milliseconds at 3000-5000 ranges. During the Marine Mammal Research Programs conducted in both California and Hawaii, there were no observations of overt or obvious short-term changes in the behavior, abundance, distribution, or vocalizations of marine mammals in response to the ATOC sound source transmissions. Although some subtle effects were revealed through statistical analyses, bioacoustics experts have concluded that these effects would not adversely affect the survival of an individual whale or the status of the North Pacific humpback whale population.					
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